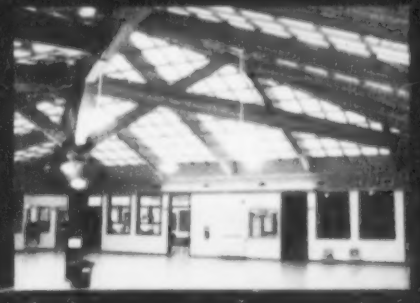
Energy Efficient Buildings:
A Plan for BC

Creating a Legacy of Energy Efficient Buildings in British Columbia



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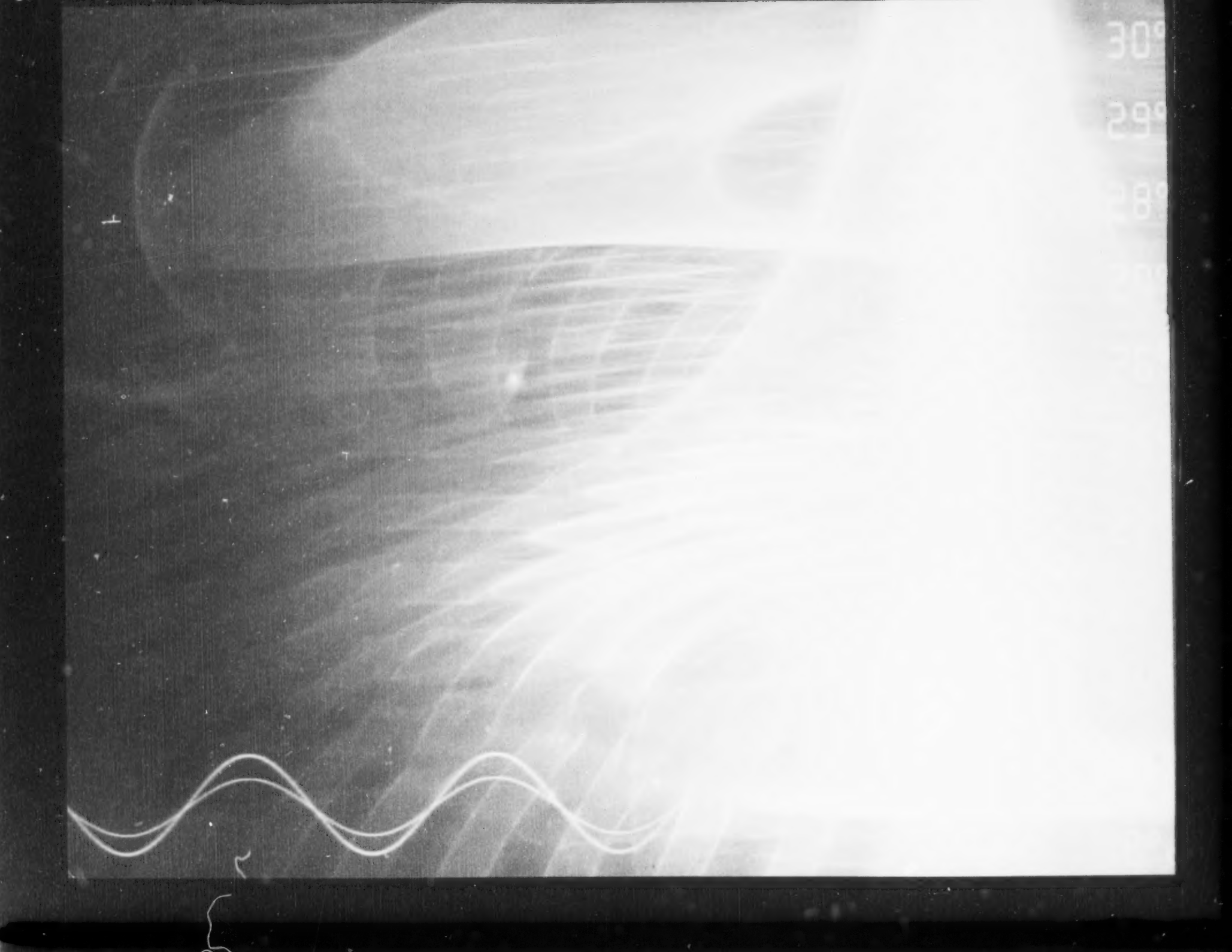

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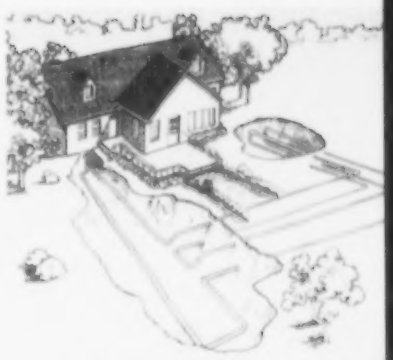

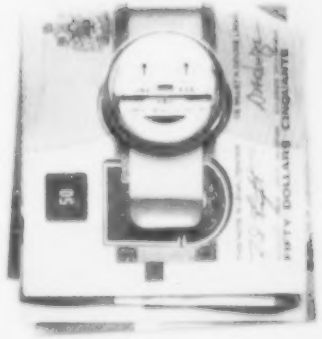

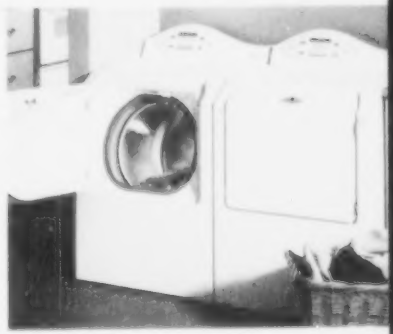

Executive Summary

The energy efficiency actions contained in this plan will deliver social, environmental and economic benefits throughout BC by conserving energy and improving the energy efficiency of homes and buildings. Some of the benefits we can expect are:

- savings for consumers throughout British Columbia
- an increase in the value of our homes and buildings
- a return on investment after an average of five years
- improved comfort and indoor air quality in our buildings
- creation of equipment manufacturing, building design, development, and trades jobs across the Province
- reduced environmental impacts, including greenhouse gas emissions reductions and lower smog-creating air emissions

In response to higher and more volatile energy costs, and to recognize new energy efficiency technologies for buildings, the Ministry of Energy, Mines and Petroleum Resources sought advice and knowledge from an Advisory Group consisting of representatives of industry, government and utilities about measures to improve the energy efficiency of new and existing buildings in BC. This plan outlines cost-effective energy efficiency targets as well as actions to achieve those targets.

This plan recognizes that many BC businesses and associations have already adopted energy efficiency practices and products. It complements ongoing local, provincial and federal programs, including those of energy providers that support energy efficiency such as BC Hydro's Power Smart Program. It supports the growth of the energy technology economy, such as high-performance windows manufactured in BC, which in turn improves the competitiveness of the provincial economy.

In setting these targets, the Advisory Group cited a number of market challenges that need to be addressed, like the lack of information available to consumers on energy efficiency and increased initial cost of energy efficient buildings, despite shorter payback periods. As well, opportunities to reduce energy consumption after construction are limited and expensive, and energy consumers are often not aware of the environmental and social costs of over-consumption of energy.

Specific actions will address these challenges, inform building occupants, and ensure developers, builders and trades are supported to achieve the energy performance targets. Information, education and capacity building programs will create awareness about the existing programs and new ones launched with this plan. A number of financial incentives will build on this awareness with the intention of stimulating voluntary measures bolstered by phased-in regulatory changes for building components and equipment.

Meeting the targets for new residential housing will increase the energy efficiency of new detached homes by an average of 36% and of new multi-unit residential buildings by 43% by 2010. Energy efficiency improvements of up to 17% will be achieved in 12% of existing detached homes by 2010.

The Ministry of Energy, Mines and Petroleum Resources will measure and report energy savings from the actions in this Plan. It will promote cooperation with energy consumers, developers, builders and tradespersons, energy utilities, local, regional, First Nation and Federal governments, industry associations, and non-profit organizations. It will also ensure that key industry and government organizations take voluntary measures and lead by example.

By taking these actions today, we can promote responsible energy use and management. We can manage rising energy costs into the future while at the same time, improve the healthfulness and comfort of our homes and the buildings where we work, learn and play.

Background

The 2002 Provincial Energy Plan provided a vision to support energy efficiency to reduce energy costs, support energy security, provide more private sector opportunities and promote environmental responsibility.

"The Province will update and expand its Energy Efficiency Act, *and will work with the building industry, governments and others to improve energy efficiency in new and existing buildings."*

Energy for Our Future: A Plan for BC, November 2002

Currently, the Provincial Government offers sales tax exemptions for high efficiency heating equipment, and materials and equipment used to conserve energy, such as:

- Energy Star-qualified furnaces, boilers, and heat pumps
- oil-fired furnaces that are 85% efficient or more
- double-glazed windows
- insulation
- draft proofing materials
- renewable energy technologies such as solar water heaters

For more than a decade, the Province's energy utilities, private energy service companies and individual consumers have accumulated expertise in reducing energy use through conservation and energy efficiency. For example, BC Hydro's Power Smart, Terasen Gas programs and FortisBC's PowerSense provide:

- consumer education
- data collection
- technical services including integrated energy system designs for commercial buildings
- industry, developer and trades capacity building
- financial incentives for efficient lights, windows, insulation, ventilation, heating systems, heat pumps, and commercial and industrial equipment

Existing programs that support energy efficiency

- BC Housing's promotion of energy efficiency.
- BC Hydro's Power Smart Program – information, support and incentives for energy efficiency options in homes, businesses, and industry. These include rebates to customers in electrically-heated homes for taking specific actions to reduce heat loss.
- Canada Mortgage and Housing Corporation – a 10% refund on loan insurance for energy efficient houses and assistance for energy-saving renovations and retrofits that will improve the energy performance of low-income households.
- Community college training programs for designers, developers, builders, and tradespersons.
- EnerGuide for Houses home energy efficiency evaluators across the Province.
- Federal and provincial Energy Efficiency Acts and the BC Building Code.
- Financial institutions - preferential financing programs for energy efficient buildings, such as VanCity Credit Union's Bright Ideas loan program.
- FortisBC's PowerSense energy efficiency program for Okanagan and West Kootenay customers.
- The Green Buildings BC program for provincial buildings such as schools and health care facilities.
- Industry - a variety of programs led by industry associations, including the Building Owners and Managers Association's Go Green program; Canadian Home Builders' Association R-2000 program; and the Heating, Ventilating and Cooling Industry Association of BC's Quality First training program.
- Local government - direct or complementary programs led by municipal, regional, and First Nation governments, including the Capital Regional District's efficient clothes washer rebate, Vancouver's Building Bylaw and Southeast False Creek Neighborhood Plan, Kelowna's Sustainable Building Strategy, and Quesnel's Community Energy Plan, among others.
- Natural Resources Canada's Office of Energy Efficiency - Commercial Building Incentive Program; Energy Innovators Initiative; Home Energy Efficiency Grant that is tied to EnerGuide for Houses audits; Federal Buildings Initiative; and Energy Star and EnerGuide for equipment.
- Non-government organizations – programs to provide information and support services on energy efficiency, such as City Green in Victoria.
- Other BC government – Ministry of Community Services, local government planning grants, and the Climate Change Action Guide supported by the Ministry of Environment.
- Private sector, energy service companies and firms - energy management services for home and building owners and managers.
- Terasen Gas programs - rebates for Energy Star qualified natural gas space-heating systems and energy efficient boilers for commercial, institutional, industrial, and multi-unit residential buildings.

BC Businesses and Associations are Achieving High Levels of Energy Efficiency

The Building Owners and Managers Association's Go Green program for commercial buildings recognizes buildings being managed with a commitment to environmental responsibility and energy efficiency. This new program has now certified nearly 40 buildings throughout BC, including the five Bentall Centre buildings in downtown Vancouver.

The Bentall buildings in downtown Vancouver are being managed with a commitment to energy efficiency. Bentall estimates its energy efficiency savings at $250,000 per annum.

The Canada Green Building Council offers the Leadership in Energy and Environmental Design (LEED) Green Building rating system, tailored specifically for Canadian climates, construction practices and regulations. The rating system recognizes new buildings which incorporate design, construction and operational practices, combining healthy, high-quality and high-performance advantages with reduced environmental impacts. The Silva Building in North Vancouver is BC's first residential building to be certified under this rating system.

Canadian Home Builders' Association of BC works with the Office of Energy Efficiency to manage the R-2000 Program in BC. The R-2000 standard is a series of technical requirements for new home energy performance that go beyond building codes.

Green Buildings BC, an initiative of BC Buildings Corporation and the ministries responsible for education and health, provides resources to help BC's education and health care agencies build high performance buildings. It also provides resources to help agencies retrofit their buildings to improve energy and water efficiency, and to reduce their greenhouse gas emissions and waste generation.

Energy efficiency investments at the Bay Downtown Vancouver store save 30% of electricity use, or $100,000 per year.

The Hudson's Bay Company (HBC) has been designated as a Power Smart Certified Customer by BC Hydro, a distinction granted to select companies that achieve an exceptional level of energy efficiency leadership. Through energy saving strategies and initiatives, HBC has saved over 4.4 GWh/year in BC, which equates to $221,615 savings per year since 2000. The company has committed to an additional reduction of 4 GWh per year in BC.

Local and regional governments in British Columbia have demonstrated leadership in energy conservation through community energy planning, and air quality and greenhouse gas management plans. In addition, several industry associations have adopted energy efficiency targets for their membership.

The Office of Energy Efficiency of Natural Resources Canada plays a pivotal role in promoting energy efficiency. For example, it develops voluntary standards such as R-2000 for energy efficient homes, and sets regulations for interprovincial trade and imports of equipment under the federal *Energy Efficiency Act*. It also provides significant energy efficiency incentives for consumers, collects energy data, conducts consumer information programs such as Energy Star and EnerGuide for Houses, and provides training programs.

All of these programs and policies have contributed to impressive gains in energy efficiency in buildings in British Columbia. In fact, energy efficiency efforts across Canada have reduced residential energy costs by nearly $4 billion between 1990 and 2001.

Building and equipment technologies have evolved at a fast pace, meaning that the energy efficiency targets of five years ago are already out-of-date, particularly considering a global increase in energy costs. This plan proposes upgraded energy efficiency targets that will help to conserve energy and improve the energy efficiency of homes and buildings throughout the Province. The targets are to be modeled after national and international standards.

This strategic plan for energy efficiency in buildings supports the overall Provincial Energy Plan, particularly Policy Action #22 that commits government to update and expand its *Energy Efficiency Act* and work with the building industry, governments and others to improve energy efficiency in new and existing buildings. By setting new cost-effective energy efficiency standards, this plan will:

- complement ongoing local, provincial and federal programs, including those of energy providers
- help to transform the market toward higher levels of energy efficiency
- promote cooperation with energy consumers, developers, builders and trades, energy utilities, other levels of government, industry associations, and non-profit organizations
- increase the healthfulness and comfort of buildings
- deliver social, environmental and economic benefits throughout BC

This plan will conserve energy throughout the Province, and over time save money for the energy consumers of British Columbia

Creating a strategy

In 2003, the Ministry of Energy, Mines and Petroleum Resources formed a Minister's Advisory Group to review options, and to make recommendations to increase energy efficient practices and equipment in new and existing buildings in BC. Members of this Advisory Group represented:

Industry

- BC Buildings Corporation
- BC Hydro
- Building Owners and Managers Association
- Canadian Home Builders' Association
- FortisBC
- Terasen Gas
- Urban Development Institute

Government

- Greater Vancouver Regional District
- Ministry of Community Services
- Ministry of Energy, Mines and Petroleum Resources
- Ministry of Environment
- Natural Resources Canada
- Union of BC Municipalities

The Advisory Group established working groups to consider energy efficiency measures for the new and existing residential, institutional, commercial and industrial buildings sectors. The working groups consulted representatives of building developers; professions and trades; building owners, managers and consumers; energy utilities; local, regional, First Nation and federal governments; provincial ministries; energy efficiency retrofit companies; and advocates. Each working group included representatives from different regions of the Province.

This consultation process identified energy efficient measures that the working groups then evaluated and ranked for:

- technical feasibility
- market acceptability
- affordability
- economic efficiency
- compliance
- energy savings
- administrative feasibility
- linkages to programs, funding, and other measures

Each recommendation in this strategic plan represents a consensus of the working groups and the Minister's Advisory Group members

The Group reported that to achieve the recommended energy efficiency targets, government, developers, energy utilities, the private sector, and energy consumers need to address a number of market challenges:

- Energy efficient designs and equipment sometimes cost more than current practices, although immediate energy savings provide short paybacks on investments. Integrated building energy and structural design practices can sometimes partly or fully offset these incremental costs through reduced requirements for mechanical or electrical equipment.
- New home buyers are seldom given information on energy performance and are rarely given a choice for energy efficient building features. As well, the opportunities to improve energy performance after construction are limited and more expensive.
- Reliable information about the most cost-effective energy efficiency measures for existing buildings is not always available. For example, many existing houses are advertised as having energy efficiency features without any specific information on their energy performance.
- Energy systems within buildings are often designed after the building design has been completed, reducing opportunities for the integration of heating, cooling, ventilation, and lighting systems to optimize the overall "building-as-a-system" energy performance.
- Energy consumers are not aware of the full environmental and social costs associated with energy use which leads to over-consumption of energy.
- The availability of energy efficient products and services for buildings varies across the Province.

FORTISBC

BC hydro

terasen

Canadian Home Builders' Association BRITISH COLUMBIA

BOMA

Green Buildings BC

UBI

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Natural Resources Canada | Ressources naturelles Canada

MINISTER'S ADVISORY GROUP MEMBERS

Setting cost-effective energy performance targets

The targets for residential housing are:

- *to achieve an EnerGuide for Houses rating of 80 for all new, detached single-family and row houses by 2010 (R-2000 energy standard) and*
- *to reduce the energy consumption in 12% of existing residential buildings by an average of 1.7% by 2010.*

This strategic plan sets voluntary, cost-effective targets for energy efficiency for new and existing buildings. The targets will be achieved by 2010, with significant support from the Ministry of Energy, Mines and Petroleum Resources including mandated energy efficiency standards for building components and equipment. The targets use well-recognized measurement units developed by the federal government.

- EnerGuide for Houses evaluates the way a house uses and loses energy. It is based on a series of technical requirements for ventilation, air tightness, insulation, and heating and cooling systems. The Ministry is working with Natural Resources Canada to include the efficiency of lighting and appliances in the EnerGuide evaluation.
- The Model National Energy Code for commercial and institutional buildings sets flexible, minimum energy efficiency standards for commercial building construction in Canada. A proposed design should be at least 25% more energy-efficient than the code.
- Energy Star identifies specific models of windows and doors, heating and cooling equipment, lighting, office equipment and appliances that are the best performers in energy efficiency.

Targets for homeowners

The federal government's EnerGuide for Houses is a one-to-100 rating for new and existing houses, with higher ratings demonstrating higher energy performance. The Advisory Group's energy study showed that new BC houses with central ventilation systems currently have EnerGuide ratings between 71 and 76, depending on the climate of their location and the heating source used. Existing BC energy ratings average 58 for homes built before 1970, 61 for homes built in the 1970's and 80's, and 68 for homes built in the 1990's.

Raising the EnerGuide rating of a new house to 80 from current levels would cost from $3,400 to $4,800 more than a standard house. This premium will fall as energy efficiency becomes more common. The homeowner would typically recover these costs through savings in five to nine years, and save money on energy for the life of the house, making energy efficiency a worthwhile investment.

Rebates for home buyers and developers are available to reduce the payback period, including a loan insurance refund from the Canada Mortgage and Housing Corporation, worth $741 for a $240,000 home. In addition, new provincial sales tax exemptions

for energy efficient heating equipment, and utility and provincial rebates for EnerGuide 80 homes, available until March 31, 2007, will reduce the up front cost.

Implementing an EnerGuide for Houses target of 80 will yield between $600 and $5,800 in savings per house over the next 15 years, over and above capital costs.

Energy Star appliances and equipment, along with compact fluorescent lighting, efficient showerheads, and high efficiency water heaters would provide additional savings. All of these products pay for their extra cost over a short period of time. Solar water heaters are also cost-effective in a number of regions.

While the EnerGuide system provides significant flexibility for improving energy performance, a typical EnerGuide 80 house would have the following cost-effective features:

- integrated heating/ventilation systems, Energy Star qualified natural gas furnaces, boilers or heat pumps
- advanced framed 2x6 walls with full insulation or 2x4 construction with wall insulation and exterior insulated sheathing
- full height basement insulation and increased attic insulation for electrically heated homes in northern BC
- low-emissivity windows (with insulated spacer filled with argon gas for the interior of BC)
- increased air tightness of the air/vapour barrier and heat recovery ventilators
- Energy Star qualified fans, and variable speed furnace blower motors, and
- programmable thermostats

The targets for existing homes (average energy savings and percentage of building retrofitted) were derived from the same research used to guide BC Hydro's Power Smart program. They are all based on specific actions that are realistic and achievable investments that will yield positive returns for home owners and renters.

Targets for businesses, institutions and multi-unit residential buildings

Voluntary measures by industry along with utility programs and a minimum energy performance standard in the Building Bylaw for the City of Vancouver has advanced the energy performance of buildings beyond the 1997 Model National Energy Code for Buildings. The Advisory Group recommended adopting the standard required under Natural Resources Canada's Commercial Building Incentive Program and LEED (Leadership in Energy & Environmental Design) Canada.

The targets for businesses and institutions are:

- [illegible]
- [illegible]
- [illegible]

Table 1: Energy Efficiency Targets for Buildings in British Columbia

Sector	Targets
New detached single-family and row houses	*Achieve an EnerGuide for houses rating of 80 by 2010, reducing the average energy consumption in new homes by 32%.*
New multi-unit residential buildings	*Achieve energy performance of 25% better than Model National Energy Code for Buildings by 2010, reducing the average energy consumption by 37%.*
New commercial, institutional and industrial buildings.	*Achieve energy performance 25% better than Model National Energy Code for Building by 2010 reducing the average energy consumption by 20%.*
Existing single-family and row houses	*Reduce the energy consumption in 12% of existing buildings by an average of 17% by 2010.*
Existing multi-unit residential buildings	*Reduce the energy consumption in 16% of existing buildings by an average of 9% by 2010.*
Existing industrial, commercial, and institutional buildings	*Reduce the energy consumption in 20% of existing buildings by an average of 14% by 2010.*

Note: targets for existing buildings are based on the 2003 energy consumption levels.

Table 2: Cumulative Benefits of Energy Efficiency Targets for Buildings for one year

Building Type	Estimated Annual Savings (millions $)					
	In 2010			In 2020		
	Electricity	Gas	Total	Electricity	Gas	Total
New detached single-family and row houses	$18	$22	$40	$98	$99	$197
New multi-unit residential buildings	$2	$7	$9	$12	$31	$43
New commercial, institutional and industrial buildings	$6	$9	$15	$29	$42	$71
Existing detached single-family and row houses	$21	$9	$30	$54	$33	$87
Existing multi-unit residential buildings	$5	$1	$6	$12	$1	$13
Existing industrial, commercial, and institutional buildings	$19	$8	$27	$52	$11	$63
All Buildings	**$71**	**$56**	**$127**	**$257**	**$217**	**$474**

To adopt this new construction standard across the province, the Advisory Group estimated capital costs of about $67 million from 2005 to 2010. However, annual savings through reduced energy demand would be $15 million in 2010 alone, increasing to $70 million in 2020.

For new commercial, institutional, industrial, and multi-unit residential buildings, paybacks on investment of between two and eight years can be achieved, depending on building type and region. The investments would include:

- efficient lighting technologies, appliances, heating and ventilation equipment
- appropriate ventilation with heat recovery to ensure indoor air quality
- high performance windows
- metering technologies
- increased levels of building insulation and air tightness

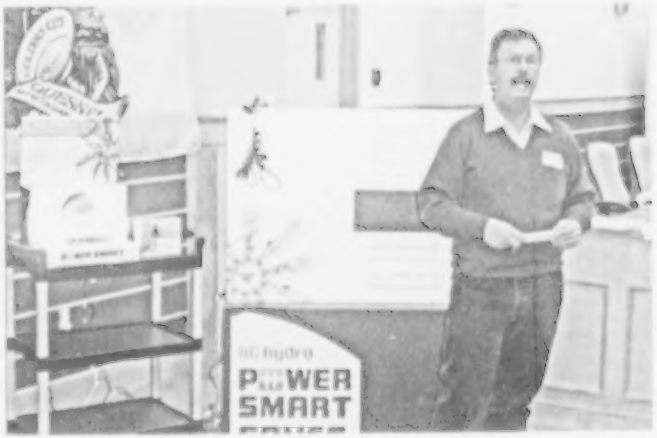
Implementing new technologies in lighting, heating, and ventilation equipment provides numerous opportunities to improve energy efficiency for existing buildings. Through training, the operations and maintenance of energy systems within buildings can also be improved.

The targets for existing buildings were derived from BC Hydro's Power Smart research.

Making energy efficiency work for everyone

In order to achieve the targets set out in this plan, energy consumers will need to invest in new technologies and designs that will pay off in lower energy costs throughout the life of the building.

To help consumers and builders take this step to greater energy efficiency and comfort, the Ministry of Energy, Mines and Petroleum Resources will oversee ten new market and policy measures. These measures address gaps in consumer awareness, in the industry's ability to deliver energy efficient products and services, in utility and government policies and programs, and in regulations.



To implement these measures, the Ministry will work with partners including the Office of Energy Efficiency of Natural Resources Canada, municipalities, energy utilities, developers, private sector businesses, and non-profit organizations. Many of these partners already offer programs that will complement the ten new measures for energy efficiency, summarized in *Table 3*.

Ministry personnel will assess energy savings and emission reductions for each measure, and document progress on capacity building, and consumer awareness. The Ministry will publish this information in an annual energy efficiency report.

Information, education, and capacity building

Walter Gray,
Mayor of Kelowna

With its partners, the Province will develop programs to increase consumer and industry awareness of the availability and cost-effectiveness of energy efficient building designs and equipment. This will include training programs for industry and consumers, and energy performance certification and labelling to inform consumers.

1. Community energy planning and leadership

In 2004, the Community Action on Energy Efficiency pilot program began in partnership with the cities of Kelowna and Quesnel. The northern community of Atlin will start a project in 2005. Coordinated by the Ministry of Energy, Mines and Petroleum Resources and NRCan's Office of Energy Efficiency, the pilot program supports municipalities to implement community-wide, energy efficiency improvements in buildings, transportation, and industry. Each community provides a "one-stop shop" of energy efficiency program information and assigns an energy efficiency coordinator to support public and private-sector projects. The program will also research ways to address barriers to the development of energy efficient buildings and the improvement of existing buildings. The Ministry intends to launch a similar First Nation and Remote Community Clean Energy Program.

If these pilot projects are successful, a permanent program will support implementing energy efficiency recommendations of approximately 20 community energy plans by 2010. Approximately 25 local and regional governments and First Nations have already completed or are developing community energy plans. The goal is completion of 50 plans by 2010, or one in five communities in the province. The Community Energy Association and others offer information, tools, and services to support community energy planning. Also, the Ministry of Community Services offers local government planning grants that can support energy planning.

2. Energy performance measurement and labeling

The Ministry of Energy, Mines and Petroleum Resources will encourage building developers, owners and managers to measure and report on the energy performance of their buildings. In addition, equipment manufacturers are already required under the federal Energy Efficiency Act to display the energy performance and consumption of heating, cooling and ventilation equipment, lighting, gas fireplaces and appliances.

With this information, building developers, owners and occupants can consider energy efficiency in their choice of building designs, retrofits and equipment. Those choices will result in more comfort due to reduced drafts, good indoor air quality, lower energy costs, and reduced environmental impact. In turn, buildings that have superior energy performance should carry a higher market value.

- For new and existing houses, the EnerGuide for Houses rating system will be promoted, supported by the Office of Energy Efficiency. Already more than 26,000 homeowners across BC have completed EnerGuide audits, and many have also invested in energy efficiency improvements. Several financial incentives are available for investments in energy efficiency, many tied to the EnerGuide rating system, highlighted in *Table 3*.
- The EnerGuide for Houses rating system will be adapted for application in multi-unit residential buildings. This will provide a rating for individual apartments and condominiums that includes a portion of the energy demand of common areas such as hallways and entrance corridors.
- The Canadian Home Builders Association of BC, BC Hydro and FortisBC will lead the development of new homes that

demonstrate EnerGuide 80 energy performance levels. This will include new clusters of homes in different regions of the province. The program will compare energy efficiency technologies to reach the EnerGuide 80 level, and work with developers, builders, trades and consumers to increase their awareness of energy efficient designs.

- For commercial and institutional buildings, professional building audits can measure energy performance. This will provide tenants with information on energy demand and costs like the amount of electricity and natural gas needed to provide energy for one square meter of usable floor space.
- The EnerGuide labeling program for appliances and heating and cooling equipment informs consumers on energy consumption levels. The Energy Star designation helps consumers choose equipment that demonstrates superior energy performance. The Ministry of Energy, Mines and Petroleum Resources will work with the Office of Energy Efficiency of Natural Resources Canada to adapt the EnerGuide for Houses system to improve ratings of houses with Energy Star lighting and appliances, along with other energy efficient equipment.

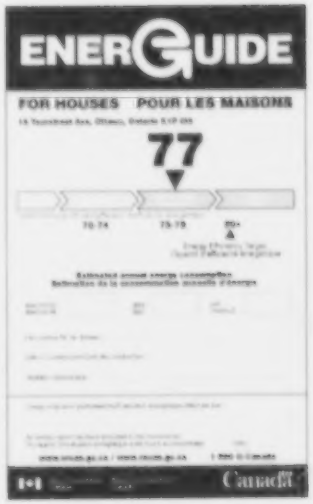
3. Industry training

The Province will support:

- Expanded, province-wide enrolment of industrial, commercial, and institutional building managers, operators, and tradespeople in building energy system management courses, in cooperation with utilities, the Building Owners and Manager's Association, Douglas College and other community colleges across B.C.
- New research and education programs to promote energy efficient new homes in cooperation with the Homeowner Protection Office, building inspectors (i.e. Building Officials Association of BC), the Canadian Home Builders' Association of BC, the Office of Energy Efficiency, BC Hydro, Terasen Gas and FortisBC.
- Expanded training opportunities for tradespeople on the installation of heating and cooling systems and windows, in cooperation with the Window and Door Manufacturers of BC, the Heating, Refrigeration, and Air Conditioning Institute of Canada, the Heating, Ventilating and Cooling Industry Association of BC, and the Residential Hot Water Heating Association of BC.

4. Smart metering

With utility companies and organizations, the Ministry will support pilot projects to install "smart" meters in different regions of the province. These meters display real-time electrical consumption information, showing how much it costs to run appliances, lights and heating and cooling systems in consumers' homes. An environmentally-friendly display home in Kelowna that opened in the summer of 2004 is evaluating the effectiveness of smart metering in promoting consumer awareness and reducing consumption. FortisBC is planning on installing smart meters in customers' homes in their Okanagan and West Kootenay service territory. In addition, BC Hydro is undertaking a study of in-home display meters with the Canadian Electricity Association to determine if this technology results in residential customers reducing electricity consumption.



Pricing and incentives

5. Harmonized energy efficiency program delivery

The Ministry of Energy, Mines and Petroleum Resources will support increased coordination among industry, government and utilities that currently operate energy efficiency programs and offer incentives. Several pilot projects in different regions will combine information and financial incentives into a single package to make investments more compelling to consumers and building developers.

Partners will include, among others:

- building industry associations such as Canadian Home Builders' Association of BC and the Condominium Home Owners Association of BC
- utilities such as BC Hydro's Power Smart program, Terasen Gas, and FortisBC's PowerSense program
- Natural Resources Canada's Office of Energy Efficiency
- Canada Mortgage and Housing Corporation
- equipment manufacturers, distributors, dealers and industry associations
- local, regional and First Nation governments
- the real estate industry
- financial institutions, including VanCity Credit Union
- non-profit organizations

Each pilot project will demonstrate the achievement of one or more of the energy efficiency targets outlined in Table 1 as a regional energy efficiency campaign. For example, energy improvements will be pursued for 12% of existing residential buildings in one or more regions. Similar programs will be launched for other sectors.

Each pilot project will designate an organization to coordinate the delivery of existing and new energy efficiency programs and incentives. The goal is to reduce overall promotion and program delivery costs through integration, and to lower consumer and building developer costs of increasing energy efficiency through high-volume equipment purchasing and targeted incentives. In addition, pilot projects will harmonize consumer information materials to reduce confusion over the many existing programs in place and introduce school education materials.

New financing and communication tools will be developed in partnership with financial institutions and the real estate industry.

6. Provincial sales tax exemptions

While the energy performance targets being proposed make economic sense, many consumers will not voluntarily invest in energy efficiency due to higher up-front costs. To encourage consumers to make the necessary investments for greater energy efficiency, the BC Government currently offers an energy conservation tax exemption for double-glazed windows, insulation, draft-reducing materials, and small-scale renewable energy technologies. In February, 2005, the Province established a new exemption for the purchase of residential Energy Star-rated furnaces, boilers, and heat pumps, and for residential oil-fired furnaces with a seasonal energy use efficiency of 85% or more. The exemption that is in effect until March 31, 2007 will save homeowners between $150 and $1,400 on the purchase of such equipment. The Ministry of Energy, Mines and Petroleum Resources will promote these exemptions and evaluate others. The existing exemption on windows will be reviewed with the potential of updating it to reflect newer energy performance levels.

7. Province-wide, building energy performance incentives

Building on the lessons learned from pilot projects, the Ministry of Energy, and Mines and Petroleum Resources will work with utilities and others to provide building and equipment rebates and incentives across the Province to achieve energy performance targets. Utility, government and private-sector partners will include several of those same partners for the regional energy efficiency campaigns.

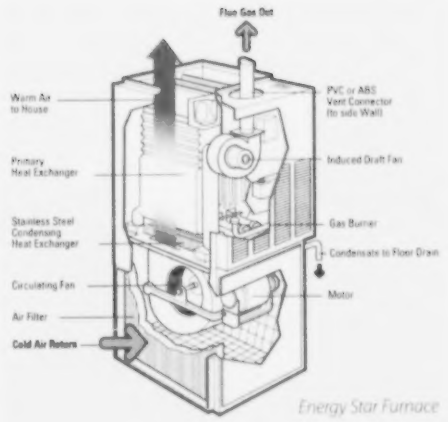
Rebates and incentives will be provided for energy efficient buildings and equipment, supporting all targets. Table 3 provides a detailed overview of support programs. These include new rebates offered by the Ministry of Energy, Mines and Petroleum Resources until March 31, 2007.

For example, for new residential buildings, province-wide rebates will support the achievement of the EnerGuide for Houses 80 rating for more than two thousand new homes by 2007. These rebates include:

- New Ministry of Energy, Mines and Petroleum Resources rebates for homes that demonstrate EnerGuide 80, including multi-unit residential buildings
- Canada Mortgage and Housing (CMHC) loan insurance refunds for EnerGuide 80 homes
- Natural Resource Canada's Commercial Building Incentive Program that includes multi-unit residential buildings
- Power Smart, PowerSense and manufacturer rebates for new energy efficient buildings and equipment such as programmable thermostats, Energy Star qualified windows, doors, lighting, appliances, fans, and heat pumps in the FortisBC service area
- Terasen Gas and manufacturer rebates for Energy Star qualified, natural gas heating equipment, variable-speed furnace blower motors, commercial boilers, gas fireplaces
- Provincial sales tax exemption on energy efficient heating equipment, insulation and windows

In addition to these confirmed incentives, municipalities will be encouraged to fast-track the approval of development and building permit applications for EnerGuide 80 homes. Financial institutions will be encouraged to introduce EnerGuide 80 mortgages with preferential rates for home buyers who don't finance with CMHC loan insurance.

To ensure that developers, builders and trades are supported to achieve the energy performance targets, these incentives will be rolled-out in concert with the training measures. Similar province-wide, building energy performance incentives will be offered for new and existing buildings in other sectors.



Energy Star Furnace

© Reproduced with permission of the Minister of Natural Resources Canada, 2005.

Voluntary measures

Widespread adoption and delivery of energy efficient building designs and equipment can only be expected if key industry and government organizations take voluntary measures and lead by example.

8. Energy efficiency in provincially funded buildings

BC Housing, which oversees subsidized housing developments in the province, and BC Buildings Corporation, which provides technical advice to all ministries regarding new and existing institutional buildings, will lead this program. The goals will be government-wide adoption of the performance targets for new provincially-funded buildings, including a target of 25% better than the Model National Energy Code for Buildings. In addition, an EnergyStar equipment procurement policy will be developed.

BC Housing will lead several pilot projects across the province to introduce the targets for new Independent Living BC and residential care facilities and for existing homes managed by BC Housing and non-profi t organizations.

The BC Buildings Corporation's Green Buildings BC program already provides customized support to school districts, universities, colleges, and health authorities to improve the energy efficiency of their buildings across the province. This program will be extended to 2007.

9. Industry leadership

The Ministry of Energy, Mines and Petroleum Resources will work with industry associations to support implementing the targeted energy performance standards. The Ministry will provide information, education and training tools, and incentives to associations that represent building owners, managers and users, to:

- encourage voluntary adoption of energy efficient technologies and building designs
- support energy efficient retrofits and improved management of energy systems in buildings

For example, the Building Owners and Managers Association's Go Green program for existing commercial buildings will be expanded across the Province to other building types such as small industrial parks, institutional buildings, and retail spaces. The objective is to certify 20% of the Association members' buildings with the Go Green designation by 2010.

In addition, the Ministry will:

- establish a partnership with the National Association of Industrial and Office Properties and other industry associations to voluntarily adopt a new energy efficiency standard throughout BC
- extend energy efficiency expertise across the Province by supporting training initiatives
- evaluate and implement technologies and systems
- promote energy efficiency in new and existing, multi-unit residential buildings

Lesley Heieis, RPA
Brookfield Properties (Vancouver) Ltd.

Regulation

10. *Energy Efficiency Act* amendments for building components and equipment

The *Energy Efficiency Act* establishes minimum energy performance standards for energy-using equipment. A comprehensive review of the Act, already underway, will determine which regulations need to be updated due to new technologies and those regulations which are no longer useful or necessary.

Any regulatory changes will be phased-in. The approach and timing will depend on the building industry and consumers' adoption of the energy performance targets through voluntary actions.

The Ministry of Energy, Mines and Petroleum Resources will consider new energy performance standards for windows and doors, residential and commercial heating systems, gas fireplaces, lighting, and other building components and equipment in the *Energy Efficiency Act* and regulations. Based on this assessment and industry consultation, it will prepare amendments to the regulations.

Regulations will be complemented by consumer education, industry training and leadership, targeted incentives, and voluntary measures in advance of implementation. These regulations will minimize costs for consumers by ensuring healthy competition in the marketplace for all equipment manufacturers and distributors.

For example, a combination of consumer information, incentives, support for BC industry participation in the Energy Star program, and a proposed regulation could result in higher efficiency levels for windows, skylights, sliding glass doors and entry doors, and construction site-assembled glazing.

All new regulations will be based on industry-supported, national standards, such as those developed by the Canadian Standards Association and the American Society of Heating, Refrigeration, and Air Conditioning Engineers.

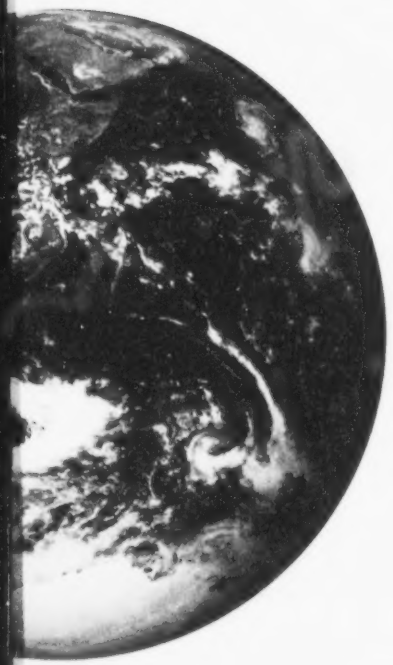
For the residential sector, targeted performance levels for furnaces are Energy Star, while targeted levels for boilers and gas fireplaces will be determined. Work on the efficiency of furnace blower motors and ventilation systems will also be pursued in concert with the Canadian Standards Association. For electric baseboard heating, electronic thermostats will be targeted in place of "bi-metallic" models. New standards for compact fluorescent lights will also be phased-in.

For commercial, institutional, industrial and high rise residential sectors, an appropriate target for heating, ventilation, cooling and lighting equipment will be developed with stakeholders.

The BC Government will also monitor compliance with the new energy performance standards for domestic hot water tanks and other equipment set in federal legislation by the Office of Energy Efficiency.

Counting the benefits of energy efficiency

Achieving these targets would result in greenhouse gas emission reductions of up to 2.3 million tonnes in the year 2020. This is equivalent to the emissions of 450,000 minivans driving 55kms per day.



Cost savings

Reaching the new energy performance targets will result in reduced energy costs for new and existing business, institutional and multi-unit residential buildings, with a two to eight year payback period on investments, depending on the size and location of the building. Paybacks will be shorter where rebates are provided. Energy efficiency investments by building owners and managers will also mean lower utility bills for rental housing and commercial tenants.

Home buyers can expect the energy cost reductions to exceed their initial investments in an average of five years, depending on location and primary heating source. This is for new homes that are built to the new energy performance targets.

Reduced energy consumption

Reducing energy consumption will help the Province maintain low energy rates for consumers. If buildings succeed in meeting the new energy targets, British Columbia will save in 2020:

- 3,400 gigawatt hours per year in electricity consumption. This is equivalent to the electricity demand of 340,000 homes or about 11% of the residential and commercial sector demand of the Province in the year 2001. These savings would be maintained over the life of the buildings and the equipment within them.
- 22 million gigajoules per year savings in fossil fuel consumption. This is equivalent to the natural gas consumption of over 200,000 homes or about 14% of the residential and commercial sector demand in the year 2001.
- Reductions in the peak electricity and natural gas demand, delaying the need to construct additional gas pipeline and power transmission capacity to meet population and economic development growth.

Leadership and innovation

Implementing this strategic plan for energy efficient buildings will:

- provide options to consumers to manage rising energy costs
- improve energy performance of buildings and reduce associated environmental impacts
- require collaboration among consumers, industry and utilities to invest in energy efficiency
- improve the healthfulness and comfort of buildings, enhancing employee productivity in commercial and institutional workplaces
- advance scientific knowledge on high-performance buildings, promoting research, innovation and best practices in building design and maintenance
- expand several key sectors of the economy, including equipment manufacturing, building design, construction and trades professions, with associated gains in skilled employment opportunities across the Province

Communities will benefit from the increased economic activity from investing in energy efficiency. Measures to encourage energy saving will contribute to environmental improvements across the province, such as reducing smog-causing emissions.

Jobs

The provincial building targets for new construction could create about 20,000 person-years of additional employment in BC from 2005 to 2020. The targets for retrofitted residential buildings could create another 32,000 person-years in the same period.

Results by 2020

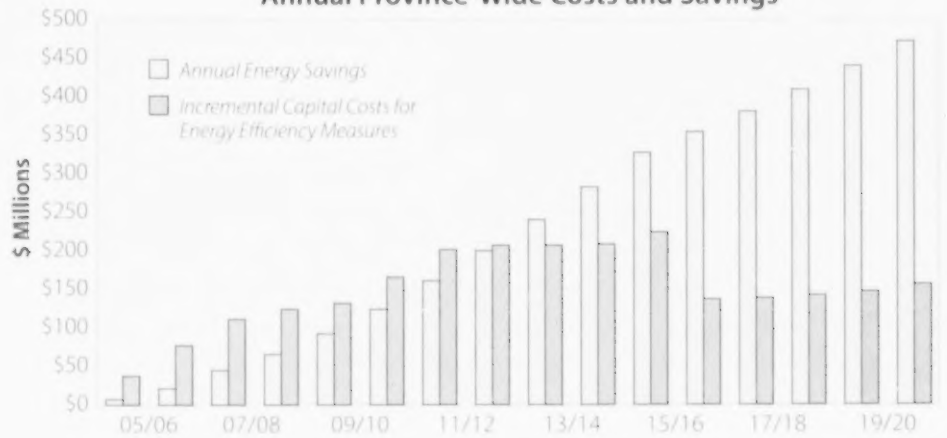
The building energy performance targets and actions outlined in this strategic plan will be introduced between 2005 and 2010. Implementing them will result in significant energy savings by 2020. This will result in the following non-discounted, net financial benefits over 15 years from lower utility bills, over and above capital costs:

- Reduced overall costs of up to $322 million for existing houses that undertake energy improvements
- Savings of up to $140 million for new, energy efficient houses
- Reduced costs of up to $69 million and $160 million respectively, for existing and new multi-unit residential buildings
- Savings of up to $330 million and $176 million respectively, for existing and new commercial, institutional and industrial buildings
- Up to $1.2 billion of province-wide energy savings in total, and
- Greenhouse gas emission reductions of up to 2.3 million tonnes – including 1.2 million tonnes per year from electricity savings (assuming the displacement of natural gas-derived electricity) and about 1.1 million tonnes from fossil fuel savings

By acting now to increase the energy efficiency of buildings and the equipment within them, we can expect savings on energy costs, and have more comfortable and healthy home and office environments.

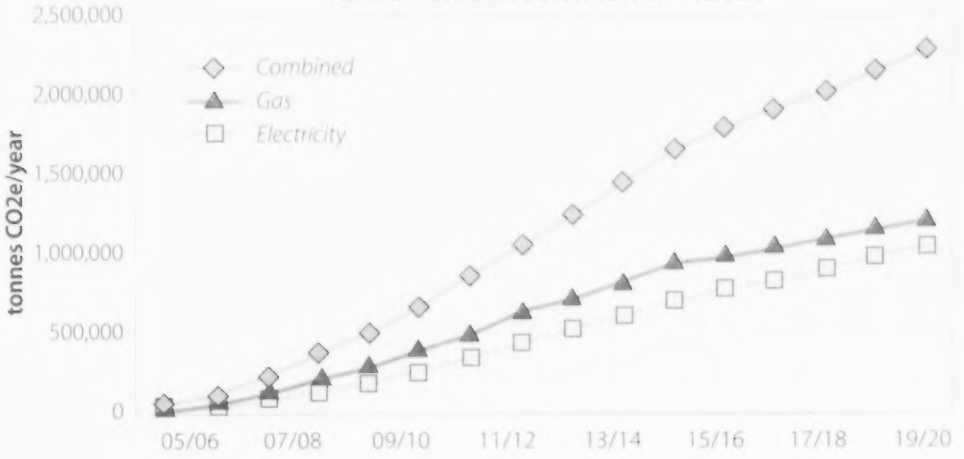
By acting now, we are also taking responsibility for the natural environment by improving air quality and lowering emissions that contribute to climate change.

Annual Province-Wide Costs and Savings



Note: capital costs drop off in 2016 due to the completion of energy efficiency improvements for existing buildings.

Annual GHG Emissions Reductions



Appendix I

INITIATIVES TO IMPROVE ENERGY EFFICIENCY OF NEW AND EXISTING BUILDINGS

New Strategy Actions

Information, Education, and Capacity Building Measures

1. **CAEE** = Community Action on Energy Efficiency Program (i.e., community energy planning and leadership)
2. **Labeling** = energy performance measurement and labeling.
3. **Training** = industry training initiatives.
4. **Smart Metering** = smart metering pilot project.

Pricing and Incentives

5. **Harmonized Programs** = harmonized energy efficiency program delivery, including regional pilot projects to achieve energy efficiency targets.
6. **PST Exemptions** = provincial sales tax exemptions for energy conservation equipment.
7. **Building Incentives** = Province-wide, building energy performance incentives.

Voluntary Measures

8. **Provincial Buildings** = energy and resource efficiency in provincially funded buildings.
9. **Industry Leadership** = energy efficient new construction, and improvements to commercial, industrial, and multi-unit residential buildings.

Regulation

10. **BC EEA** = BC Energy Efficiency Act amendments for energy-using equipment.

Existing Initiatives

CBIP = NRCan's Office of Energy Efficiency (OEE) Commercial Building Incentive Program.

CMHC = Canada Mortgage and Housing Corporation, 10% refund on loan insurance for energy efficient houses

EEI = OEE's Energy Innovators Initiative.

EGH Grant = OEE's Home Energy Efficiency Grant, tied to EnerGuide for Houses audits.

Energy Star = OEE's Energy Star and EnerGuide for equipment programs.

ESCO = private sector, energy service company financing and implementation of energy efficiency.

Federal EEA = Federal Energy Efficiency Act.

Financial Institutions = preferential financing for energy efficient building, including VanCity Credit Union's "Bright Ideas" loan and Integris Credit Union's (Quesnel) "Light-en Energy Loan".

Industry Leadership = voluntary programs such as Building Owners and Managers Association's Go-Green, the Canada Green Building Council's LEED standard, the National Association of Industrial and Office Properties' program, and the Canadian Home Builders' Association's R-2000 program.

Local Government = direct or complementary initiatives led by municipal, regional, and First Nation governments.

NGO = initiatives of non-government organization such as CityGreen Victoria, West Coast Environmental Law, Pembina Institute and others.

PowerSense = FortisBC's Power Sense energy efficiency program.

Power Smart = BC Hydro's Power Smart energy efficiency program.

Terasen = Terasen Gas' demand-side management program.

Table 3: Initiatives to Improve Energy Efficiency of New and Existing Buildings

	Information and Capacity		Pricing and Incentives	Voluntary Measures	Regulation
New Single Family, Row Housing and Low-Rise Multi-unit Residential Buildings	**CAEE** Energy Star **Industry Leadership Labeling** Local Government	**Smart Metering** PowerSense Power Smart **Training**	**Building Incentives** CMHC **Harmonized Programs** Power Smart PowerSense **PST Exemptions** Terasen	**CAEE** Financial Institutions **Industry Leadership** (Canadian Home Builders' Association) Local Government **Provincial Buildings** (BC Housing)	**BC EEA** Federal EEA
Existing Single family, Row Housing and Low-Rise Multi-Unit Residential Buildings	**CAEE** Energy Star **Industry Leadership Labeling** Local Government **Smart Metering**	NGO PowerSense Power Smart **Training**	CMHC EGH Grant Financial Institutions **Harmonized Programs** Local Government Power Smart PowerSense **PST Exemptions** Terasen	**CAEE** **Industry Leadership** (Condominium Home Owners' Association of BC) NGO **Provincial Buildings** (BC Housing)	**BC EEA** Federal EEA
New Industrial, Commercial, Institutional, and High-Rise Multi-Unit Residential Buildings	**CAEE** Energy Star **Industry Leadership** Local Government PowerSense Power Smart	**Smart Metering** Terasen **Training** NGO	**Building Incentives** CBIP CMHC **Harmonized Programs** Power Smart PowerSense **PST Exemptions** Terasen	**CAEE** **Industry Leadership** (National Association of Industrial and Office Properties and LEED) Local Government **Provincial Buildings** (Green Buildings BC, BC Housing)	**BC EEA** Federal EEA Local Government (GVRD Air Quality Management)
Existing Industrial, Commercial, Institutional, and High-Rise Multi-Unit Residential Buildings	**CAEE** Energy Star ESCO **Industry Leadership Labeling** Local Government	NGO PowerSense Power Smart Terasen **Training**	EEI ESCO **Harmonized Programs** Power Smart PowerSense PST Exemptions Terasen	**CAEE** **Industry Leadership** (Building Owners and Managers Association) Local Government NGO **Provincial Buildings** (Green Buildings BC)	**BC EEA** Federal EEA

Note: New programs are in bold

Internet Resources

BC's Energy Efficiency clearinghouse
http://www.empr.gov.bc.ca/EnergyEfficiency/default.htm

BC Energy Efficiency Act
http://www.qp.gov.bc.ca/statreg/stat/E/96114_01.htm
http://www.qp.gov.bc.ca/statreg/reg/E/389_93.htm

BC Hydro's Power Smart Program
http://www.bchydro.com/powersmart

BC Provincial Sales Tax exemptions for energy conservation
http://www.rev.gov.bc.ca/ctb/publications/bulletins/sst_011.pdf
http://www.rev.gov.bc.ca/ctb/EnergyStarQualified.htm

BOMA Go-Green (existing commercial)
http://www.boma.bc.ca/gogreen

BuildSmart website (Greater Vancouver Regional District)
http://www.gvrd.bc.ca/buildsmart/pubs.htm

Canada Green Building Council (Leadership for Energy and Environmental Design)
http://www.cagbc.org/

Canada Home Builders Association
http://www.chbabc.org

Canada Mortgage and Housing Corporation (new and existing residential)
http://www.cmhc-schl.gc.ca/en/moinin/moinbuho/moinbuho_022.cfm

City of Kelowna Sustainable Building Pilot Project
http://www.city.Kelowna.bc.ca/CM/Page888.aspx

Commercial Building Incentive Program (new commercial, institutional, and multi-unit residential)
http://www.oee.nrcan.gc.ca/newbuildings/

Community Energy Planning
http://www.communityenergy.bc.ca

Energy Innovators Initiative (existing commercial, institutional, and multi-unit residential)
http://www.oee.nrcan.gc.ca/eii/

EnerGuide for Houses and Home Energy Efficiency Grant (existing residential)
http://www.oee.nrcan.gc.ca/houses-maisons/

EnerGuide for equipment
http://www.oee.nrcan.gc.ca/equipment/

Commercial and Institutional Energy Service Company Listing
http://www.greenbuildingsbc.com/retrofit/qbi.html

Energy Star equipment
http://www.oee.nrcan.gc.ca/energystar/

FortisBC's PowerSense program
http://www.fortisbc.com/services/bc/powersense_main.htm

Federal Energy Efficiency Act
http://www.oee.nrcan.gc.ca/regulations/

Green Buildings BC (new and existing institutional)
http://www.greenbuildingsbc.com

R-2000 and EnerGuide for New Houses program (new residential)
http://www.oee.nrcan.gc.ca/r-2000/

Terasen Gas
http://www.terasengas.com

VanCity Credit Union's Bright Ideas loan (existing residential)
http://www.vancity.com/Personal/Borrowing/EnvironmentalOptions/BrightIdeasHomeFinancing

Notes

Notes

Financial Partners

PowerSmart

BC hydro

POWER SMART

Fortis BC

Canada

Terasen

Terasen

PowerSense

POWER SENSE™

For more information contact:

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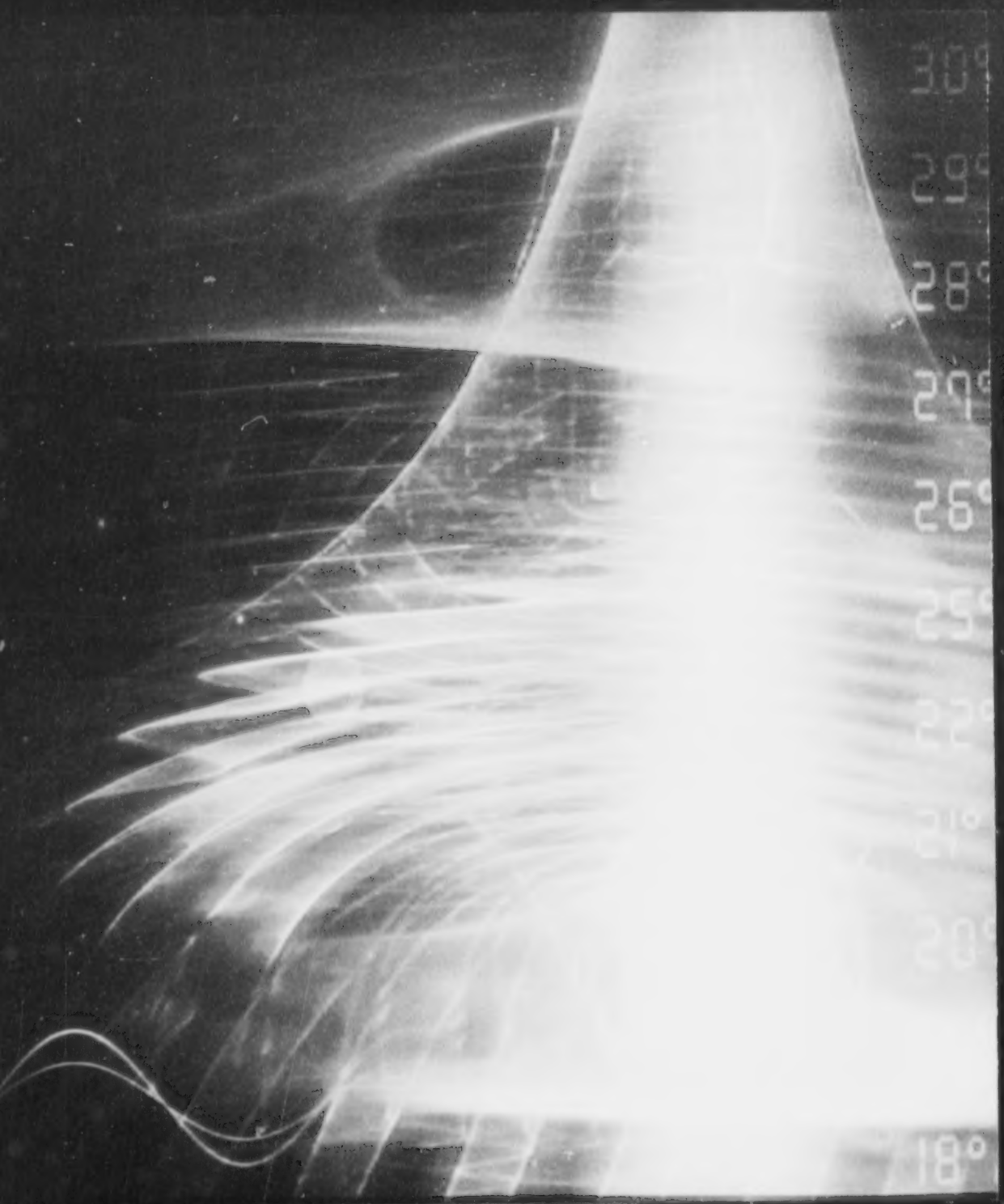

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